ARS Grape and Wine Industry Workshop
Monday July 11, 2005
Pest and Disease Management Discussion Synopsis

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Each of the plant disease management breakout sessions began with an overview of the industry research priorities that were generated prior to the meeting (i.e. see "Pre-identified" research priorities below). This list was compiled after a significant effort had been made to canvas the industry and establish research priorities. The results of this informal survey were compiled and a relative rating was given to each priority based on the responses received from the industry. The results of this survey are shown below. It should be noted the even though Pierce's Disease was rated as the number one concern by the industry it was agreed by all that more dollars, and effort, are spent on Mildew and weed control. However, given the fact that some control measures are available for both mildew and weeds these issues were placed lower on the priority list

Charge to the breakout sessions: Need to identify key research issues, pests and diseases, flush out and define issues, prioritize, far out ideas were welcomed but we need to reach a consensus on the major research priorities of the group.

The industry "Pre-Identified" Research Priorities shown above were used to initiate the discussion in each of the Pest and Disease breakout sessions. Below is a description of the consensus that was reached in the pest and disease breakout sessions.

A.) A consensus was reached in terms of the research areas that fall into the **high** priority category for the industry.

- The establishment of economic thresholds for microbial pathogens, insects and nematodes (some ARS research). A subsection of this topic is the continued development of effective Integrated Pest Management practices that use well documented pest thresholds including situations with multiple pests and specific environmental stress e.g. water, and nutritional status. In addition research needs to continue in the area of developing "softer" chemicals for pest control in sustainable production systems.

- Development of alternatives to MeBr fumigation, especially for such diseases as Crown Gall. On a related note it was agreed upon that new management strategies need to be developed for the post-plant control of plant parasitic nematodes.
- Yield vs. quality issues. (e.g. Sensory),
- Consumer acceptance issues,
- Characterization of pathogenVector issues such as thresholds, host feeding preferences and the examination of potential new insect vectors.
- Commodity differences,

- Insects, weeds, & diseases
  Pierce's disease/vectors
- Need improved methods to control stored raisin pests:
  - Indian meal moth, saw tooth beetle, raisin moth,
  - dried fruit beetle (ARS),
  - fumigation alternatives to control mold
  - alternatives to post harvest fungicides; (splits correlated with mildew infections, nodular molds with Dried On Vines)

- Mildews: fungus/weather interactions, epidemiology/model refinement

- Pathogen detection/identification, development of rapid sensitive, cost effective PCR based detection/ID systems.

- Viral screening, clean stock, virus detection, vector control (MO,WA, PA)

- Weeds: Alternatives to traditional management practices, new thresholds, redefine competition, floor management, interaction w/biocontrol agents, biocontrol for noxious weeds or other organic methods,

- Herbicide movement-offsite, non-target effects, effect on rhizosphere/soil microbial communities, invasive weeds, development of alternative weed control measures/agents

- Fungal wood diseases: Eutypa and Botryospheria, need effective control/management strategies. *Eutypa* is still a major grapevine disease for which there is still no effective control. This need is pressing

- Mealy bugs (MBugs): virus vectors, association with ants, parasitoids, biopesticides, Biocontrol measures for mealy bug control is highly desired by the industry.

B.) In addition to the above listed "high priorities", the breakout session participants felt that the following issues were important issues that also needed to be presented.

- It was generally agreed upon by all that research into the discovery and development of biological control agents for all pests should be an emphasis area for ARS. This should also include examination of such things as green manures/mustards for nematode suppression.

- Alternatives to pre harvest fungicides

- Harmonia (Asian lady beetle): chemistry, preharvest control, process chemistry, repellents vs. wine quality, trap design (ARS), attractants (aggregation pheromones), epidemiology, multiple crop interactions. In certain regions of the

country this is a significant problem given the fact the 2-3 beetles trapped in the grapes can impart an off-taste to a 1,000gal batch of wine.

- Development of host plant resistance to insects, disease, nematodes, and PD using both traditional breeding techniques as well as molecular genetic/plant cell transformation approaches. (ARS): Alternative nematode controls.

C.) Finally, the breakout session participants established a third tier of research areas that we felt were significant problems under specific environmental conditions or in specific regions of the country.

- Grapevine yellows diseases
- *Phylloxera* (Fisher): aerial, soil, and movement. This pest is of significant concern in Oregon.
- Japanese beetle: milky spore (tech transfer, area wide), Studies to enhance biological control in addition to establishing population threshold values biocontrol, threshold, population modeling
- Establishment of effective control measures for the bunch rot fungal complex
- Develop the system that would detect/predict the importation of exotic pests and then have the plans in place for its control
- Crown gall: need control solutions, soil interactions-soil survival, plant stress interaction In general, this disease is more of a problem in cold climates where frost and freeze damage generates (freeze damage)
- Grape root borer
- Clearly define pest management components for organic production (wine, table, raisin): weeds, diseases (mildews, bunch rots)

There was a wide ranging discussion surrounding the use of GMO's in viticulture production systems. No consensus was reached. However, it was generally felt that the use of pest/disease resistant transgenic grapevine root stocks may have the greatest chance of public acceptance in the future. It was noted that GMO initiatives were once again up for a vote in Sonoma County of California.